

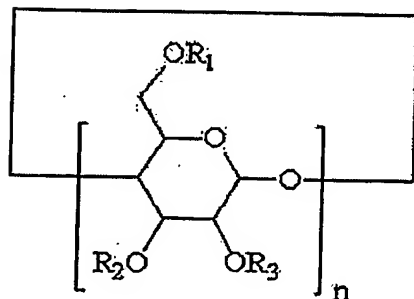
What is claimed is:

1. In an ultra-low dielectric film for a copper interconnect prepared using an organic or inorganic matrix and a cyclodextrin-based template for pore formation, the improvement comprises: said ultra-low dielectric film is prepared by coating
5 with an organic-inorganic mixed solution containing in an organic solvent 40-70 vol% of a polyalkyl silsesquioxane precursor or its copolymer as the matrix and 30-60 vol% of acetylcyclodextrin nanoparticles as the template.

2. The ultra-low dielectric film for a copper interconnect according to claim 1,
10 wherein said polyalkyl silsesquioxane copolymer is a copolymer of alkyltrialkoxysilane and α,ω -bistrialkoxysilylalkane.

3. The ultra-low dielectric film for a copper interconnect according to claim 2,
15 wherein said polyalkyl silsesquioxane copolymer is a copolymer of methyltrimethoxysilane and α,ω -bistrimethoxysilylethane or a copolymer of methyltrimethoxysilane and α,ω -bistriethoxysilylethane.

4. The ultra-low dielectric film for a copper interconnect according to claim 1, wherein said acetylcyclodextrin is represented by the following formula 3:



(3)

wherein n is an integer of 6-8; R_1 , R_2 and R_3 are independently a hydrogen atom or an acetyl group; and at least one of R_1 , R_2 and R_3 is an acetyl group.

5. The ultra-low dielectric film for a copper interconnect according to claim 4,
5 wherein said acetylcyclodextrin is selected from the group consisting of triacetyl- α -cyclodextrin, triacetyl- β -cyclodextrin, triacetyl- γ -cyclodextrin, diacetyl- α -cyclodextrin, diacetyl- β -cyclodextrin, diacetyl- γ -cyclodextrin, monoacetyl- α -cyclodextrin, monoacetyl- β -cyclodextrin and monoacetyl- γ -cyclodextrin.
- 10 6. The ultra-low dielectric film for a copper interconnect according to claim 1, wherein said organic solvent is selected from the group consisting of dimethylformamide (DMF), dimethylacrylamide (DMA) and dimethylsulfoxide (DMSO).
- 15 7. The ultra-low dielectric film for a copper interconnect according to any one of claims 1-6, wherein said ultra-low dielectric film has a maximum porosity of 60% and a minimum dielectric constant of 1.5.